NRCS Natural Resources Conservation Service

Underground Outlet

Conservation Practice Job Sheet 620

Definition

An Underground Outlet (UGO) is a conduit installed beneath the surface of the ground to carry runoff to a suitable outlet.

Purpose

The purpose of the UGO is to carry excess water to a suitable outlet from terraces, water and sediment control basins, diversions, waterways, subsurface drains, surface drains or other similar practices without causing damage by erosion or flooding.

Where used

An underground outlet can be installed when surface outlets are impractical because of stability problems, climatic conditions, land use, farmability, or equipment traffic. A UGO can be used as the only outlet for a structure or practice or it may be used in combination with other types of outlets.

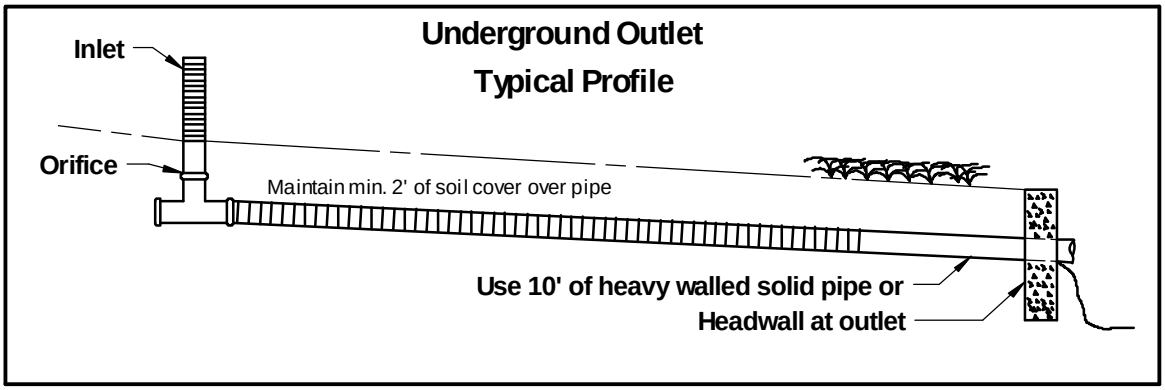
The conduit for a UGO can be either solid or perforated pipe depending on the site specific design.

The inlet to a UGO can be constructed of many different types of materials but the most common are heavy duty perforated plastic risers. The outlet of a UGO should have either a 10 foot section of solid heavy duty pipe or a headwall. The UGO must outlet into stable watercourse that is protected from erosion caused by flows from the UGO.

Both the inlet and outlet of a UGO should be protected from the entry of small animals. The outlet animal guard should be installed so that it does not impede the flow from the UGO.

Conservation management system

UGOs can provide a direct conduit to receiving waters for contaminated runoff from crop land. UGOs and the accompanying structure or practice should be installed as part of resource management plan that addresses issues such as nutrient and pest management, residue management and filter areas.



Capacity

The capacity of an underground outlet is based on requirements of the structure or practice it serves. The underground outlet can be designed to function as the only outlet for a structure or it can be designed to function with other types of outlets.

The capacity of the underground outlet should be adequate for the intended purpose without causing inundation damage to crops, vegetation, or works of improvements.

Inlet

The inlet can be a collection box, a perforated riser, or other appropriate device. For perforated risers, use durable, structurally sound material that is resistant to damage by rodents or other animals. Use fire resistant materials for the inlet if fire is an expected hazard.

Inlets must have an appropriate trash guard to ensure that trash or other debris entering the inlet passes through the conduit without plugging.

Conduit

The minimum allowable conduit diameter is 4 inches. Material can be corrugated plastic, smooth plastic, clay tile, concrete or other suitable pipe material. Joints should be smooth using materials and methods recommended by the manufacturer of the pipe material.

Outlet

The outlet must consist of a continuous 10 foot section or longer of closed pipe or a headwall at the outlet. If a closed pipe is used, the material must be durable and strong enough to withstand anticipated loads, including those caused by ice. Do not place outlets in areas of active erosion.

Operation and maintenance

Conduct the following operation and maintenance activities to ensure the practice works properly.

- Periodically inspect, especially immediately following significant runoff events, to keeping inlets, trash guards, and collection boxes and structures clean and free of materials that can reduce flow.
- Promptly repair or replacement of damaged components.
- Repair or replace inlets damaged by farm equipment.
- Repair of leaks and broken or crushed pipes.
- Periodically check the outlet and animal guards to ensure proper functioning.
- Repair any eroded areas at the pipe outlet.
- Maintain of adequate backfill over the pipe.

See site specific O&M requirements on page 3.

Specifications

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standards Water and Sediment Control Basin (638).

Underground Outlet – Job Sheet

Landowner_____ Field number_____

Purpose (check all that apply)	
☐ Convey concentrated flow runoff	☐ Other (specify):
☐ Reduce gully erosion	
☐ Protect/improve water quality	

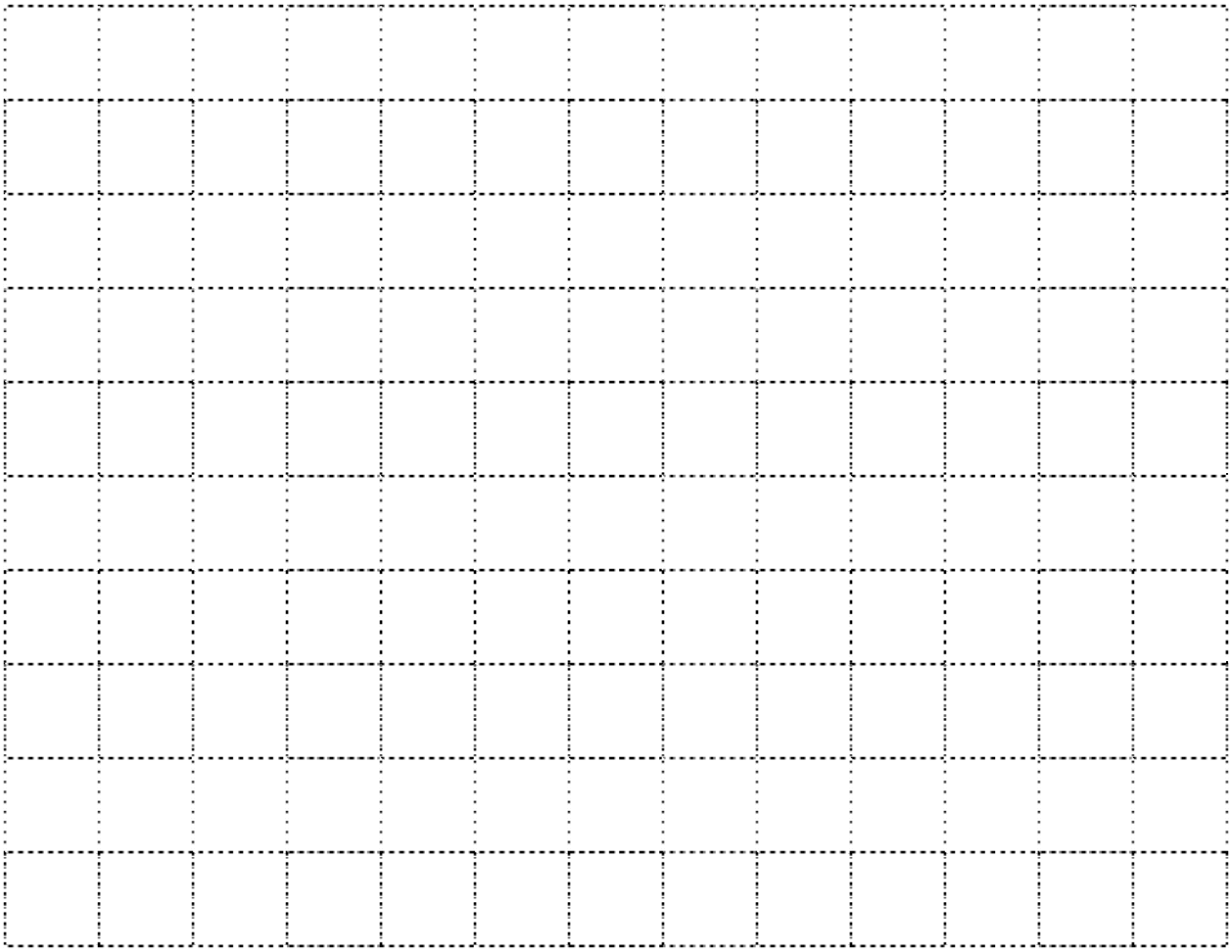
Underground Outlet	Reach #1 sta ___ to sta ___	Reach #2 sta ___ to sta ___	Reach #3 sta ___ to sta ___
Diameter (in)			
Grade (%)			
Riser Diameter			

Site Preparation
Add site specific details for site preparation
Underground Outlet
Add site specific details for underground outlet installation
Operation and Maintenance
Add site specific details O&M

Underground Outlet – Job Sheet

Profile of Underground Outlet installation site shown below.

Scale 1"=_____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

Underground Outlet – Job Sheet

As – Built Measurements

Underground Outlet			
Diameter (in)			
Grade (%)			

CHECK OUT:

Amount Completed: _____number. Mark As-Built location on plan map

Remarks_____
_

Checked by: _____ Date: _____

Approved by: _____ Date: _____